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To the Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Your Petitioner, JEFFREY A. JOHNSON, a citizen of the United States and resident of the State of Nebraska, having a mailing address of 16352 Page Street, Omaha, Nebraska, 68118, prays that Letters Patent may be granted to him for an improvement in

## AN ADJUSTABLE MUSICAL INSTRUMENT STAND

as set forth in the following specification:

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

This invention relates to the art of stands for musical instruments, primarily keyboards and other horizontally situated instruments such as keyboards, and in the adjustability of such stands with the instrument mounted thereon.

## 2. Description of the Prior Art

Musical instrument stands of various types are well known and widely used. Typically such stands consist of multi-legged structures that support either the instrument or an undercarriage. Some are composed of a base and a single support that holds a frame on which the instrument rests (a “pillar” configuration). Few of the stands are adjustable in height.

One instance of such a stand is described in U.S. Patent No. 5,467,953. That patent describes an instrument stand having essentially two legs, each leg having an end for contact with the floor and an end for supporting the instrument (an “X”

1 configuration). The legs were pivotably joined at their middles, and the angle between  
2 them adjusted to adjust the height of the instrument. The adjustment was regulated by  
3 a locking gear mechanism having a plurality of working positions.

4 Another such instance of a stand is described in U.S. Patent No. 5,984,245.  
5 That patent teaches a similar "X" configuration instrument stand having as its  
6 positioning device an assembly comprising a control rod, a spring and two positioning  
7 discs. The assembly is manipulated by handlebars on each leg, and the angle between  
8 the legs is adjusted accordingly.

9 These designs and other that have been designed have failed to provide a stand  
10 that may be adjusted with the instrument still mounted on the stand.

#### 11 SUMMARY OF THE INVENTION

12 The invention therefore has, as a primary object, the improvement of musical  
13 instrument stands in such a way that they can be adjusted while the instrument remains  
14 on the stand. This object is met by different mechanisms appropriate to the type of  
15 stand employed. Ideally, each such mechanism will be operable by foot, so that the  
16 operator will be able to adjust the stand while playing the instrument.

17 One example of such a mechanism that could be employed on a stand having  
18 two legs in an "X" configuration would be a powered piston attached to each of the two  
19 legs and adapted to draw the legs toward or away from each other. Another example of  
20 such a mechanism that could be employed on a stand having a single "pillar"  
21 configuration would be to have the pillar adjustable support a support frame, and have  
22 a winch or similar drive adjust the height of the frame. Such a construction makes it

1 possible to move the instrument from a first position, where, perhaps, the user is sitting  
2 at a keyboard, to a second position, where the user is standing at the keyboard, without  
3 having to remove the instrument from the stand, and without having to stop playing the  
4 instrument.

5 The invention is described in the following with reference to embodiment  
6 examples shown in the drawings.

7 Additional objects of the invention will be set forth in the description that follows,  
8 and will become apparent to those skilled in the art upon examination of the following.

#### 9 BRIEF DESCRIPTION OF THE DRAWINGS

10 The features advantages of the present invention will become more clearly  
11 appreciated as a description of the invention is made with reference to the appended  
12 drawings. In the drawings:

13 FIG. 1 is a side elevational view of the invention in a "pillar" configuration.

14 FIG. 2 is a front elevational view of the invention in a "pillar" configuration.

15 FIG. 3 is a side elevational view of the invention in an "X" configuration.

16 FIG. 4 is a front elevational view of the invention in an "X" configuration.

17 FIG. 5 is a side elevational view of the invention in a "table" configuration.

18 FIG. 6 is a front elevational view of the invention in a "table" configuration.

#### 19 DETAILED DESCRIPTION OF THE INVENTION

20 Preferred embodiments of the present invention will be described below by  
21 making reference to the drawings.

1           The present invention was developed for use with keyboard instruments. The  
2 stand, as shown in Figures 1-6, may take one of several forms.

3           In the first example of the invention, as shown in Figures 1-2, the stand **10**  
4 includes a base **12**. The base **12** includes multiple legs splayed outwardly from a  
5 central point. The legs may be adjustable for the purposes of conforming to an uneven  
6 surface, or may be adjustable in length to provide optimal stability. The stand **10** also  
7 comprises at least one substantially vertical pillar **14** extending upwardly from the base  
8 **12**.

9           A keyboard support **16** is supported on the pillar **14**. The keyboard support **16**  
10 comprises at least one substantially horizontal member on which a keyboard **100** may  
11 be mounted. Ideally, for stability purposes, the keyboard support **16** should have a  
12 single broad surface, as shown, or have two or more horizontal members that are  
13 spaced widely enough to prevent movement of the keyboard when the keyboard is  
14 played.

15           The keyboard support **16** should not be affixed to the pillar **14**, but should be  
16 adjustably mounted on the pillar **14** so that it may move vertically along the length of the  
17 pillar **14**. This may be achieved by providing the keyboard support **16** with a collar **18**  
18 that fits around the pillar **14**. To provide ease of movement, the collar **18** may  
19 incorporate rollers, ball bearings, low friction material lining, or other such materials as  
20 are well known in the art. Alternatively, the keyboard may be mounted to a collar **18**  
21 that fits within a chamber (not shown) in the pillar **14**. Ideally, in this configuration, the  
22 collar **18** should have an exterior horizontal cross-sectional profile substantially

1 equivalent to the interior horizontal cross-sectional profile of the channel in the pillar **14**.  
2 The instrument stand **10** should also have means for moving the keyboard vertically  
3 along the pillar **14**. This may be provided by mechanical, hydraulic, or other means. In  
4 the example shown, the instrument stand includes an electric motor **20**, a foot switch  
5 **22**, and a vertically disposed, externally threaded screw member **24**. The screw  
6 member **24** is adapted to fit into an internally threaded aperture **26** in the collar **18**. The  
7 vertically disposed screw member **24**, which is essentially parallel to the pillar **14**, is  
8 rotated by the electric motor **20**. Ideally, the foot switch **22** will include a control that  
9 activates the electric motor **20** and turns the screw member **24** selectively in a  
10 clockwise or counterclockwise direction. Rotation of the screw member **24** will result in  
11 the raising or lowering of the keyboard without removing the keyboard from the  
12 keyboard support **16**.

13 Another mechanism that may be used would be a winch and pulley system (not  
14 shown). The pulley may be included at the top of the pillar **14** or at the top of the  
15 interior chamber of the pillar. The mechanism may include a winch at the base of the  
16 stand **10** and a cable that extends either through the chamber or along the pillar to the  
17 pulley and downwardly to the collar **18**. Activation of the winch would pull the collar **18**  
18 upwardly and the raise the keyboard. Release of the winch would allow the keyboard to  
19 be drawn downwardly by force of gravity. Alternatively, the cable may be attached to  
20 the collar **18** so that it may exert force on the collar **18** selectively from the top and the  
21 bottom, and the winch arranged to move the cable in either of two directions such that  
22 activation of the winch results in the controlled adjustment of the height of the keyboard

1 without removing the keyboard from the keyboard support 16. A further embodiment of  
2 this invention (not shown) would position the winch at the top of the pillar, and would  
3 work generally in the manner described.

4 In a second embodiment of the invention, shown in Figures 3 and 4, the  
5 instrument stand 10' comprises two legs 30 pivotally joined at a central point 32. Each  
6 leg 30 has a bottom end and a top end. The bottom end of each leg should have  
7 horizontally extending legs 34 that are adapted to hold the keyboard stand 10' upright.  
8 The top end of the legs 30 should include means to support the keyboard. Although  
9 such means may incorporate horizontally extending legs, ideally, the top ends of the  
10 legs should engage a horizontal keyboard support 36. The horizontal keyboard support  
11 36 should be adjustably mounted on the top ends of the two legs 30. It should be  
12 mounted on the two legs such that the legs 30 may move horizontally along the length  
13 of the keyboard support 36. Such a configuration would allow for the raising and  
14 lowering of the stand while maintaining the keyboard in a horizontal position.  
15 Furthermore, a mechanism may be employed to maintain the keyboard in a central  
16 position with relation to the keyboard stand through the use of a twin rack and pinion  
17 mechanism (not shown), or other such mechanism well known in the mechanical arts.

18 The invention further comprises means to adjust the angle between the two  
19 legs 30. This may be comprised of a mechanical or hydraulic actuator mounted on the  
20 legs between the pivotal center point and the upper or lower ends of the legs 30. As  
21 shown in Figure 4, the means comprises a hydraulic piston 38 having a first end 40  
22 mounted on the first leg and a second end 42 mounted on the second leg. The

1 hydraulic piston is attached to a hydraulic pump **44** that can alter the pressure within the  
2 hydraulic piston **38**. The pump, ideally, is activated by a foot switch **46**. As shown in  
3 the drawings, by reducing the pressure in the piston **38**, the angle between the legs  
4 **30** is reduced and the keyboard is raised without removing the keyboard from the  
5 keyboard support **36**.

6 A third embodiment of the invention comprises a traditional table-style stand **10"**.  
7 The stand **10"** includes at least two vertically disposed legs. The legs will be designed  
8 to provide stability to the stand, either by the provision of numerous legs or by the  
9 provision of legs providing a large enough base to lend stability to the stand **10"**. In the  
10 embodiment shown, the stand incorporates two pedestal-type legs **50**, each having a  
11 base **52** that extends outward horizontally from the plane defined by the two legs. Each  
12 leg comprises a base section **54** that is affixed to its base and an adjustable section **56**  
13 that is axially adjustably mounted on the base section. The adjustable sections **56** are  
14 each affixed to a keyboard support **58** on which the keyboard **100** is mounted. The  
15 stand **10"** includes a mechanism, such as those earlier described, to move the  
16 adjustable legs axially along the length of the base section, resulting in the raising or  
17 lowering of the keyboard. Ideally, the raising or lowering of the keyboard support **58** is  
18 effectuated by the activation, by foot switch **59** or other control of a single mechanism,  
19 as exemplified by the electric motor **60** that is shown in Figure 5. Preferably, the  
20 adjustable sections of the legs are moved simultaneously by a double rack and pinion  
21 mechanism **62** or a chain drive or similar device as are well known in the art.

1           In the several embodiments of the invention described, the keyboard may remain  
2   affixed to the instrument stand and the keyboard height adjusted. No removal of the  
3   keyboard is necessary to adjust the height. The design may be changed so that the  
4   adjustable keyboard support may raise or lower more than one keyboard. The design  
5   may also be used in conjunction with a fixed keyboard support so that a selected  
6   number of keyboards may be raised or lowered while at least one keyboard remains  
7   stationary. Similarly, more than one adjustable keyboard support may be mounted on a  
8   stand.

9           It will be appreciated that the present invention is not limited to the exact  
10   construction that has been described above and illustrated in the accompanying  
11   drawings, and that various modifications and changes can be made without departing  
12   from the scope and spirit thereof. It is intended that the scope of the invention only be  
13   limited by the appended claims. Thus it can be seen that all of the objects of the  
14   invention are met.

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